a factor of ~$1/(2)^{1/2}$, however recently this has accelerated, both in the magnitude of the change in minimum bin size and the

III. APPROACH TO CONTAMINATION IN PURION IMPLANTERS

Designing in particle mitigation solutions for contamination control is well understood and in deployment in most ion implanters. For example, all Axcelis high current ion implanters have utilized high voltage shields which detect the early onset of arc formation and act to interrupt the HV supplies to allow the arc to dissipate before high levels of particles can be generated. However, in order to meet the aggressive specifications being demanded

voltage breakdown in the final lens element, and the data presented demonstrate this is not the case for the Purion M. The second set of experiments were on a Purion H system in a controlled environment designed to test compliance to the particle specifications of a leading Logic manufacturer. Finally, a series of aggressive metals implants were conducted on all three implanters in the Purion suite of systems, to demonstrate efficacy of eradication of surface metal contamination.

Figure 2 depicts data taken over a 1 year period from the Purion M ion implanter at a customer site. The number of wafer starts per day was variable throughout the duration of the experiment. Measurements were made on bare Si and the sample frequency averaged 1 sample every other day (this represents a far higher sampling rate than would normally be conducted on a medium current tool in production). Historically, low tool utilization leads to particle excursions due to thermal cycling of the beamline components, however there were no data to support this occurring on the Purion M. The global mean was 3 adders at > 65nm, and compliance to the customer specified UCL was 96% throughout the duration of the evaluation. These data compare favorably to levels attained by the tool of record in production. Data were also taken at the lower 45nm bin size limit during the sample period, and were found to be